

## Fertilizer Effects in a Seedling Test for Gynoecious Expression

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Seedling tests for gynoecious expression are useful for checking the degree of gynoecey of inbred lines being developed in a breeding program for use in the production of gynoecious hybrids. The test is usually run with a high degree of plant stress to determine how stable the gynoecious expression is. We have generally grown plants in flats in crowded conditions to stress the plants and to save space in the greenhouse. However, recently a test run where no fertilizer was added to the soil demonstrated that there is an optimum degree of stress in the test, at least under North Carolina greenhouse conditions (high temperature and light).

The objective of this experiment was to determine the effect of fertilizer on gynoecious expression of gynoecious and monoecious lines in a crowded-flat seedling test.

Methods. Two lines (Gy 14A and SMR 18) were tested in 57 x 57 mm square peat pots (in flats) containing a mix of sand, soil and peat in equal volumes. Two seeds were planted (8 November, 1985) in each peat pot and thinned to 1 seedling at cotyledon stage. The plants were given one of 4 fertilizer treatments: none, starter fertilizer mixed in with the soil, starter plus 1 liquid fertilizer treatment added at first true leaf stage, or starter plus liquid fertilizer in all waterings (approximately 4 per week).

Fertilizer-line combinations were replicated 1 time with 24 plants per treatment unit. Data were collected at full flowering stage (12 December, 1985), 34 days after planting. Number of pistillate and staminate nodes were counted in each treatment unit.

Results. The percentage of pistillate nodes on Gy 14A increased from 0 to 70 as more fertilizer was added to the soil medium (Table 1). All treatments where fertilizer was added provided a good test, but starter fertilizer was necessary to have pistillate flowers develop. The greatest difference between Gy 14A (a gynoecious inbred) and SMR 18 (a monoecious inbred) occurred at the highest amount of fertilizer added. When no fertilizer was added, the gynoecious and monoecious lines could not be distinguished. Also, many plants died before flowering in the treatments where no fertilizer was added.

Therefore, the level of stress should not be too high if the test is to work properly. Light, fertilizer and water should be provided in optimum amounts, with stress provided by crowding of plants into a small root volume. Additional benefits of crowding are the resulting saving of space in the greenhouse.

Table 1. Number (percentage) of pistillate and staminate nodes on plants of Gy 14A and SMR 18 grown in 57 x 57 mm square peat pots.

Fertilizer <sup>y</sup>	Number of pistillate nodes		Number of staminate nodes	
	Gy 14A	SMR 18	Gy 14A	SMR 18
None	0 (0)	0 (0)	34 (100)	8 (100)
Starter	72 (65)	0 (0)	38 (35)	80 (100)
Starter + Once	43 (36)	0 (0)	76 (64)	111 (100)
Starter + Every	78 (70)	0 (0)	33 (30)	58 (100)

<sup>z</sup>Data were collected on 24 plants per treatment combination.

<sup>y</sup>Fertilizer added as complete starter fertilizer and liquid fertilizer in the irrigation water (at first leaf stage, or in every watering).